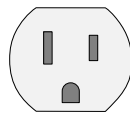




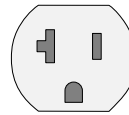
## Understanding 20A Plug / 15A Receptacle Incompatibility

### **1. If you're struggling with a plug that won't fit into a receptacle, you should first figure out what you're dealing with.**

- a. **IDENTIFY the receptacle:** The receptacle (outlet) on the left is a NEMA 5-15R and has a maximum current rating of 15A. The one on the right is a NEMA 5-20R and has a maximum rating of 20A.

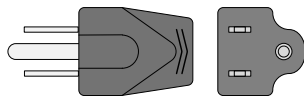


NEMA 5-15R

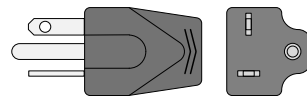


NEMA 5-20R

- b. **IDENTIFY the plug:** The plug on the left is a NEMA 5-15P and has a maximum current rating of 15A. The one on the right is a NEMA 5-20P and has a maximum rating of 20A.



NEMA 5-15P



NEMA 5-20P

- c. **INCOMPATIBILITY:** A 20A plug simply WILL NOT fit a 15A receptacle. The two devices are intentionally designed *not* to fit together, and no amount of twisting, pushing or bending will make them.
- d. **WHAT TO DO:** Arrange for a qualified electrician to check the branch circuit that feeds the receptacle. If it's a 20A circuit then it is permissible, Code-wise, to replace the 15A receptacle with a 20A receptacle. However, if you have a 15A branch circuit then it would be a Code violation to change the receptacle without also upgrading the branch circuit, which would require changing the circuit breaker and may also involve some building re-wiring. *Whatever steps you take, be sure to comply with all national and local building codes, being mindful that local codes may be more stringent than national (National Electric Code = NEC).*

### **2. Why aren't all receptacles 20A so everything fits together?**

Virtually all residential construction uses 15A receptacles because they're much cheaper than 20A. Since a majority of 125vac consumer products, commercial equipment and light industrial machinery require less than 15A, 15A plugs are provided on their power cords as well.

The NEC requires that a 20A receptacle is installed on a 20A branch circuit when there is only one receptacle connected to that circuit. If there are two or more receptacles on a 20A circuit (a duplex is *two* receptacles) then it's permissible to use 15A rated receptacles as it's unlikely that any one receptacle on a circuit with two or more receptacles would ever realize a full 20A load. That's why, even though most commercial buildings are required to have 20A branch circuits the receptacles are often 15 amp devices.

### **3. Why do manufacturers make products with 20A plugs?**

Many installers, consultants, engineers and other professionals request products with 20A ratings. Manufacturers are required to meet all applicable safety standards and codes, so if a product is designed to operate with a 20A load then all of its components must meet the established standards for a 20A rated product and pass the tests that qualify it to carry a Nationally Recognized Testing Laboratory (NRTL) listing. That means adding a 20A plug and cord to the product.

### **4. Is there a way to minimize plug/cord incompatibility?**

Don't assume that a 20A rated power product would be better than a 15A model for your project. Ask yourself two questions:

- a. **Will the product actually have a NEMA 5-20P plug?** Advances in energy efficiency make it more likely to find equipment with a 15A plug.
- b. **Will the *total* load on the circuit exceed 15A?** If you have two pieces of processing gear, a wireless mic receiver, a CD player, and a couple of small amplifiers then the total load may be under 15A. To be certain you will need to review the specs for each piece of equipment and add them together.

### **5. Conclusion**

The point is that you needn't buy a dump truck if you only need a wheelbarrow. When you really need a 20A product then use it but be aware there may be compatibility issues between the product's plug and the on-site receptacle.

\* *For additional information on the NEC visit [www.nfpa.org](http://www.nfpa.org) or check with your local authority having jurisdiction.*